IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty Docket No.: A01568
AECM

In re Application of: CLAMEN et al. : Confirmation No. 2226

Serial No. 10/806,580 : Group Art Unit: 1713

Filed: 03/23/2004 : Examiner: Sastri, S.

For: CURABLE AQUEOUS COMPOSITION AND USE AS HEAT-RESISTANT NONWOVEN BINDER

DECLARATION UNDER 37 C.F.R. Rule 1.132

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Fax No. 703-872-9306

Sir:

I, Barry Weinstein , declare and state:

1. I received a Ph.D. in organic chemistry at the State University of New York (SUNY), at Stony Brook, in 1978 and held a Post Doctoral Fellow position at the Massachusetts Institute of Technology, Cambridge, Massachusetts, from 1978-80. I have been employed by Rohm and Haas Company, at the Spring House research facility, 727 Norristown Rd., Spring House, PA, 19477, for about 26 years. During that period of time I have been named an inventor of 40 issued US patents. My current position is Rohm and Haas Fellow.

2. I am a co-inventor in the above-referenced application ("the "580 application").

3. The claims of the '580 application as they presently stand are directed to a curable aqueous composition comprising (a) a polyacid having at least two carboxylic acid groups, anhydride groups, or salts thereof, (b) a polyol comprising at least two hydroxyl groups; and (c) an emulsion polymer comprising, as copolymerized units, greater than 30% by weight, based on the weight of said emulsion polymer solids, ethylenically unsaturated acrylic monomer comprising a C_5 or greater alkyl group, wherein the ratio of the number of equivalents of said carboxylic acid groups, anhydride groups, or salts thereof to the number of equivalents of said hydroxyl groups is from 1/0.01 to 1/3. The claims also recite a method for treating a substrate with the composition comprising contacting the composition with the substrate and heating the composition to a temperature of from 120 to 400°C.

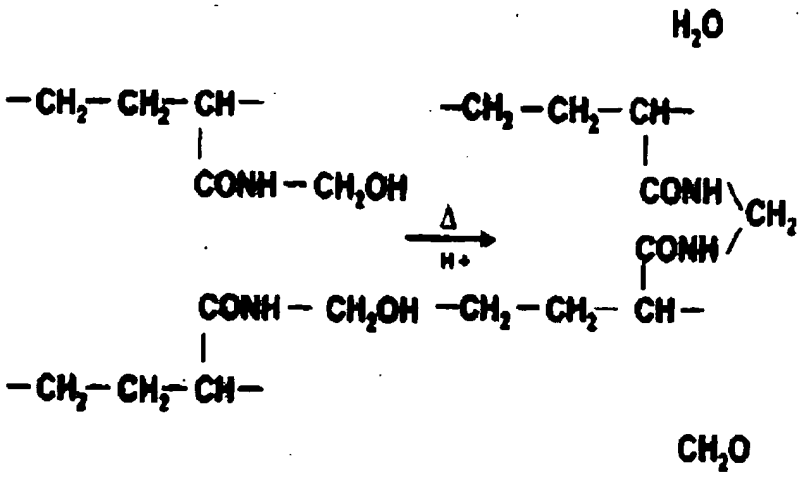
4. I have reviewed the Office Action dated June 20, 2006 in the above-identified application. Specifically, I have read the rejection of instant claims 1-7 and 11-17 over the combination of Arkens et al., U.S. Patent 5,977,232 (Arkens), in view of Mudge et al, U.S. Patent 4,610,920 (Mudge). I have also reviewed each of the Arkens and Mudge references.

5. I understand that Arkens recites formaldehyde free curable aqueous compositions, by which Arkens means that the composition is substantially free from formaldehyde CH_2O and does not liberate substantial formaldehyde as a result of drying and/or curing; that is, typically, less than 1 ppm of CH_2O, based on the weight of the composition, is present in a formaldehyde free composition. See the Abstract and column 2, lines 44-49.

6. I understand that Mudge discloses an emulsion or latex binder prepared by polymerization of a mixture containing 1 wt.% or more, based on the weight of latex binder solids, of N-methylol containing monomer or polymer, such as N-methylol acrylamide (MOA) monomer or the N-methylol polymers disclosed on

column 5 of Mudge. See Mudge at column 1, lines 37-36, column 3, lines 3-9 and column 5, line 19 to column 6, line 4.

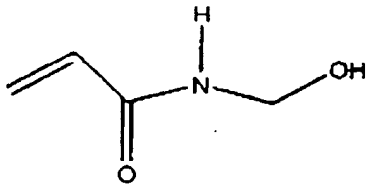
7. The evolution of formaldehyde from MOA containing latexes releases 0.5 mole of CH_2O per mole of MOA, as follows:



Mlynar, M., "Chemical Binder", Conference Proceedings: INTC, Baltimore, MD, (2003)

8. I performed the following calculations to show that the Mudge latex or emulsion comprising a polymer with the minimum disclosed 1.0 wt.% MOA, as repeat copolymerized units, cannot comprise a formaldehyde free system, as taught by Arkens:

The structure of MOA is as follows:



$C_4H_7NO_2$
Exact Mass: 101.05
Mol. Wt.: 101.10
C, 47.52; H, 6.98; N, 13.85; O, 31.65

Formaldehyde (CH_2O) has a Mw of 30.0 and is liberated as a function of the cure of MOA at a rate of 0.5 mole CH_2O per mole of MOA; therefore approximately one half of 29.5% of MOA, by weight, (30.0 out of 101.5 grams of MOA/2) can generate formaldehyde as it cures. Please be advised that Mudge cures its latex polymers at from 145 to 155°C (see col. 6, lines 63-66). Accordingly, if an emulsion copolymer comprises the polymerization product of 0.5 wt.% MOA, then it has the potential of liberating ((1.0%/100% X 30.0g/101.5g X 0.5 mole CH_2O/mole MOA) X 1,000,000 ppm) or 1478 ppm CH_2O.

Assuming that the emulsion copolymer binder of Mudge has the lowest solids content reasonably disclosed (25% wt. solids) and no added thermosetting methylol polymer, Mudge uses (100 parts dry binder/105 parts coating composition) X 25% wt. solids) 24 wt.% latex binder solids and the binder composition liberates (1478 X .24) or 354.72 ppms CH_2O. See Mudge et al. at column 4, line 61 to col. 5, line 2 and col. 9, lines 38-46.

9. I reviewed all of the possible N-methylol containing monomers listed at column 2, lines 37-44 of Mudge and determined that no monomer suggested in Mudge could result in a formaldehyde-free latex that could be used in the art of Arkens, as shown by the following:

Mudge discloses lower alkanol ethers of N-methylol methacrylamide. Even if one looking at Mudge assumes that Mudge contemplates an octanol ether of N-methylol methacrylamide, mol. wt. 230 (which Mudge does not actually disclose), the lowest amount of CH_2O released from a 25 wt.% solids latex binder system comprising a polymer having 1 wt.% of the N-methylol containing monomer, as repeat copolymerized units, is ((1.0%/100% X 30g/230g X 0.5 mole CH_2O/mole monomer) X 1,000,000 ppm) or 652 ppm CH_2O.

Assuming that the emulsion copolymer binder of Mudge has the lowest solids content reasonably disclosed (25% wt. solids) and no added thermosetting methylol polymer, Mudge uses (100 parts dry binder/105 parts coating composition) X 25% wt. solids) 24 wt.% latex binder solids and the binder

composition liberates (652 X .24) or 156.5 ppms CH_2O. See Mudge et al. at column 4, line 61 to col. 5, line 2 and col. 9, lines 38-46.

Thus in the most generous estimate of the most favorable implied case in Mudge, the amount of formaldehyde liberated on cure from the Mudge latex is 156.5 ppm, which is far greater than the upper limit of 1 ppm of CH_2O liberated on cure of any composition useful in Arkens (see Arkens et al. at column 2, lines 44-49).

6. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

Date: September 20, 2006

Dr. Barry Weinstein